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THROUGH: **Ex. 4 - CBI** SERAS Program Manager  
SERAS QA/QC Officer

FROM: **Ex. 4 - CBI** QA/QC Chemist

SUBJECT: VERIFICATION/COMPLETENESS CHECK – DIMOCK, PA LABORATORY DATA  
[File NAREL 1200016-Ra 226.pdf](#)  
[File NAREL 1200016-Ra 228.pdf](#)  
[File NAREL 1200016-alpbet.pdf](#)  
[File NAREL 1200016-gamma.pdf](#)  
[File NAREL 1200016-Th.pdf](#)  
[File NAREL 1200016-U.pdf](#)

## INTRODUCTION

On June 22 and 25, 2012, a review of the case narratives and corresponding certificates of analysis from the U.S. EPA National Air and Radiation Environmental Laboratory (NAREL Reports Posted June 20) was conducted at the SERAS facility in accordance with the Follow-Up Verification/Completeness Check agreed upon during our teleconference on Wednesday 2/8/12.

The assumptions for this review include the following: 1) Case narratives from the EPA and Regional labs and/or subcontract labs have been reviewed in accordance with EPA, Regional or Environmental Services Assessment Team (ESAT) protocols and contain all pertinent and complete information to conduct the completeness check. SERAS will base this review on the information provided by the laboratory and not on an actual data package; and 2) SERAS will relay any “red” flags to the EPA R3 personnel to resolve and determine data usability.

## OBSERVATIONS

In accordance with Table 1 – Field and QC Sampling Summary (Rev01 - 2/3/12), Table 2 – Sample Analytical Requirements Summary (Rev01 – 2/3/12), Methods for Groundwater and Surface Water, NAREL AM/SOP-14 Radium-226 Analysis in Water by Eichrom, Methods for Groundwater and Surface Water, NAREL AM/SOP-13 Radium-228 in Environmental Matrices, Methods for Groundwater and Surface Water, NAREL AM/SOP-4 Gross Alpha and Beta in Ground Water, Methods for Groundwater and Surface Water, NAREL AM/SOP-3 Standard Operating Procedure for Gamma-Ray Spectrometry, Methods for Groundwater and Surface Water, NAREL AM/SOP-1 Actinides in Environmental Matrices by Extraction Chromatography and the validation guidelines developed by SERAS for radiochemical data (using critical value of 1.65), the following observations were noted and need to be clarified/resolved.

### General Statement:

1. Raw data were not provided; it is assumed that all sample, method blank and QC results (LCS, Matrix Spikes and Duplicates) were correctly transferred to the analytical result tables.

### File NAREL 1200016-Ra 226.pdf

1. The sample result was less than the  $2\sigma$  uncertainty and the MDC and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following results should be qualified non-detect “UJ” in the results column qualifier column in Scribe: Ra 226 for samples FB22 and HW62.

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2. The following sample results failed the normalized absolute difference (NAD) criteria (based on the method blank or field blank). The following results should be qualified estimated "J" in the results column qualifier column in Scribe: Ra 226 for samples HW64, FB23, HW63Z and HW63.
3. It is assumed that all required instrument/system criteria were met by the laboratory or had no impact on the data

File NAREL 1200016-Ra 228.pdf

1. The sample result was less than the  $2\sigma$  uncertainty and the MDC and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following results should be qualified non-detect "UJ" in the results column qualifier column in Scribe: Ra 228 for samples FB22, FB23 and HW63.
2. The following sample results failed the NAD criteria (based on the method blank or field blank). The following results should be qualified estimated "J" in the results column qualifier column in Scribe: Ra 228 for samples HW64, HW63Z and HW62.
3. It is assumed that all required instrument/system criteria were met by the laboratory or had no impact on the data.

File NAREL 1200016-alpabet.pdf

1. The sample result is greater than the  $2\sigma$  uncertainty but less than the MDC and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following result should be qualified non-detect "UJ" in the results column qualifier column in Scribe: Beta for sample HW63Z.
2. The sample result was less than the  $2\sigma$  uncertainty and the MDC and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following results should be qualified non-detect "UJ" in the results column qualifier column in Scribe: Alpha for samples FB22, HW64, FB23, HW63Z, HW62 and HW63 and Beta for samples FB22, HW64, FB23 and HW62.
3. The following sample results failed the NAD criteria (based on the method blank or field blank). The following results should be qualified estimated "J" in the results column qualifier column in Scribe: Beta for sample HW63.
4. It is assumed that all required instrument/system criteria were met by the laboratory or had no impact on the data

File NAREL 1200016-gamma.pdf

1. The sample result is greater than the  $2\sigma$  uncertainty but less than the MDC and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following result should be qualified non-detect "UJ" in the results column qualifier column in Scribe: Pb214 for sample FB23.
2. The absolute value of the sample was less than the  $2\sigma$  uncertainty. The following results should be qualified as non-detect "U" in the results column qualifier column in Scribe: Th234 for samples HW64 and HW63Z, Bi212 for samples HW63Z and HW62 and Ra228 for samples HW63Z and HW63.
3. The absolute value of the sample was less than the  $2\sigma$  uncertainty and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following results should be qualified as non-detect "UJ" in the results column qualifier column in Scribe: Ra226 for samples FB23, HW63Z and HW63, Ra228 for samples: FB23 and HW62, U235 for samples FB23 and HW63Z, K40 for samples HW63Z and HW63 and Th234 for samples HW62 and HW63.
4. The sample result was less than the  $2\sigma$  uncertainty and the MDC. The following results should be qualified as non-detect "U" in the results column qualifier column in Scribe: Bi214 for samples FB22 and FB23.
5. The sample result was less than the  $2\sigma$  uncertainty and the MDC and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following results should be qualified non-detect "UJ" in the results column qualifier column in Scribe: K40 for samples FB22, HW64 and HW62, Pb214 for sample FB22 and Bi212 for samples FB23 and HW63.
6. The following sample results failed the NAD criteria (based on the method blank or field blank). The following results should be qualified estimated "J" in the results column qualifier column in Scribe: Bi212 for samples FB22 and HW64, Ra226 for samples FB22, HW64 and HW62, Ra228 for samples FB22 and HW64, Th234 for samples FB22 and FB23, U235 for samples FB22, HW64, HW62 and

HW63 and K40 for sample: FB23.

7. It is assumed that all required instrument/system criteria were met by the laboratory or had no impact on the data

File NAREL 1200016-Th.pdf

1. The sample result is greater than the  $2\sigma$  uncertainty but less than the MDC and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following result should be qualified non-detect "UJ" in the results column qualifier column in Scribe: Th228 for sample HW63Z.
2. The absolute value of the sample was less than the  $2\sigma$  uncertainty. The following results should be qualified as non-detect "U" in the results column qualifier column in Scribe: Th227 for sample HW63Z and Th232 for sample HW63.
3. The sample result was less than the  $2\sigma$  uncertainty and the MDC and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following results should be qualified non-detect "UJ" in the results column qualifier column in Scribe: Th227 for sample FB22, Th228 for samples FB22, FB23 and HW63, Th230 for samples FB22, HW64, FB23, HW63Z and HW62, and Th232 for samples FB23, HW63Z and HW62.
4. The following sample results failed the NAD criteria (based on the method blank or field blank). The following results should be qualified estimated "J" in the results column qualifier column in Scribe: Th232 for samples FB22 and HW64, Th227 for samples HW64, FB23, HW62 and HW63, Th228 for samples HW64 and HW62 and Th230 for sample: HW63.
5. It is assumed that all required instrument/system criteria were met by the laboratory or had no impact on the data

File NAREL 1200016-U.pdf

1. The sample result was less than the  $2\sigma$  uncertainty and the MDC and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following results should be qualified non-detect "UJ" in the results column qualifier column in Scribe: U235 for samples FB22, HW64, HW63Z and HW63, U238 for samples FB22, HW64 and HW62 and U234 for samples HW64 and FB23.
2. The following sample results failed the NAD criteria (based on the method blank or field blank). The following results should be qualified estimated "J" in the results column qualifier column in Scribe: U234 for samples FB22 and HW62, U235 for samples FB23 and HW62, and U238 for samples FB23 and HW63Z.

cc: Ex. 4 - CBI SERAS Project Officer  
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